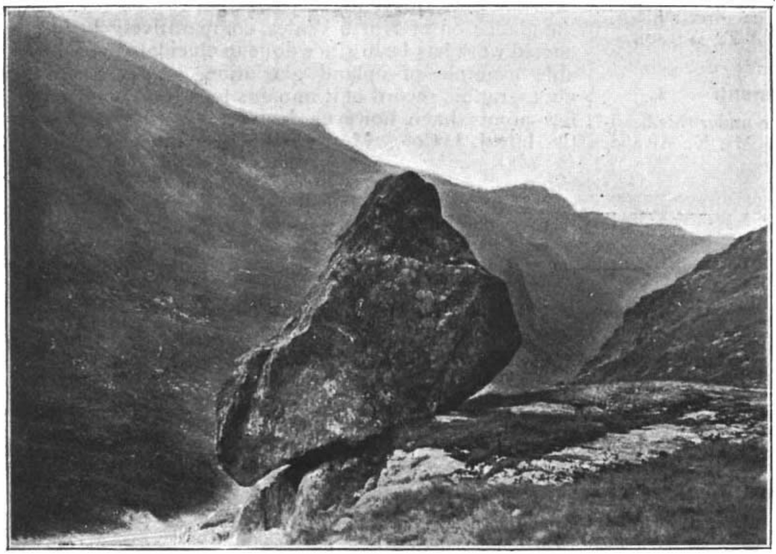
Llanberis, and looks as if a mere touch would precipitate it into the Pass below.

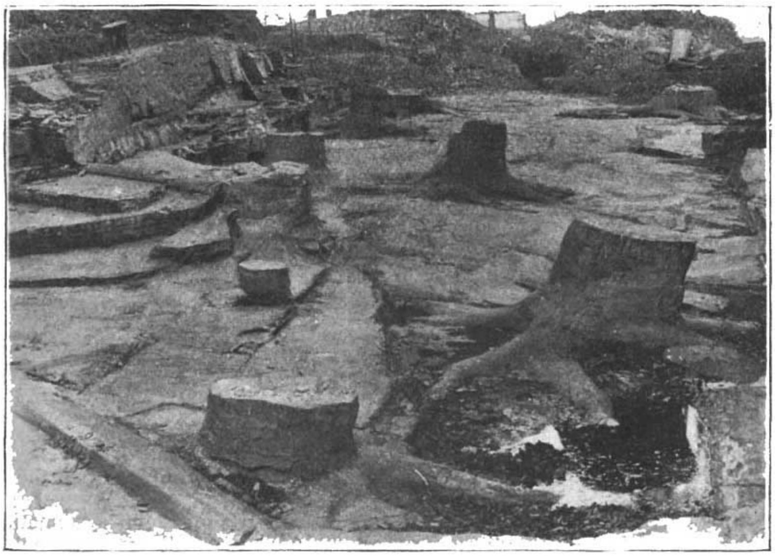
Photographs have often been taken of single examples of fossil trees in submerged forests and in the coal-measures or other rocks. But it is not often that a whole forest of Carboniferous trees is exposed to-day in quarrying operations, and it is still more rare to have them preserved for future generations by a building, as has been done in the instance from Partick, figured below. This photograph was taken by Mr. R. McF. Mure, of Paisley, who has kindly furnished me with particulars as to the size of the trees: the stems are most of them over two feet in diameter at the base, and the spread of the roots in some cases is correspondingly large.

W. W. WATTS.



Photographed by Mr. G. Bingley, Headingley, Leeds.] [*Copyright.*

FIG. 2.—Y Foel, Perfedd, Llanberis.



Photographed by Mr. R. McF. Mure, Paisley.] [*Copyright.*

FIG. 3.—Carboniferous Forest, Partick, Glasgow.

SOME RARE BIRDS' EGGS.

ON comparing the numerous works which have appeared of late years on British birds with their predecessors of a couple of decades or more ago, we cannot fail to be struck with the great diminution in the number of species whose eggs and nests are stated to be unknown. And since the appearance of even the more recent of these, one more gap has been filled up by the announcement of the discovery by Mr. Popham, last July, on an island in the mouth of the Yenisei, of the long-sought eggs of the curlew-sandpiper (*Tringa subarquata*). By this fortunate discovery the number of species entitled, even by the utmost stretch of courtesy, to be included in the British list whose eggs still remain unknown, is very small indeed, although there are several species of which the known specimens are extremely few. Of course there are a host of foreign birds whose nidification awaits discovery, but to mention even a portion of these would obviously be impossible within the limits of an ordinary article. The majority of the British species whose breeding haunts offered the longest resistance to the efforts of egg-hunters, were those which migrate at this season to the desolate Arctic tundras; and among the eager explorers of the avifauna of those regions the name of John Wolley will always stand pre-eminent, ably as his pioneer efforts have been seconded and completed by men of the stamp of the late Mr. H. Seebohm and Colonel Feilden, to say nothing of many equally enthusiastic and capable observers. At the present day one of the great fields remaining for exploration are the breeding areas of many of the species inhabiting the southern hemisphere.

In many respects birds' eggs have proved a somewhat disappointing study, since, if we except their aid in bringing about the recognition of the intimate structural affinities existing between the Limicolæ and the Gaviæ, they have afforded comparatively little assistance in unravelling the tangled skein of avian relationships. And many of the generalisations which have been drawn from them, such as those relating to white eggs, have turned out to be true only in part. Moreover, it is unlikely that those remaining to be discovered will add anything really important to our stock of knowledge. The newly-discovered eggs of the curlew-sandpiper, for example, do not differ from those of the allied forms in any more important degree than do the different postage-stamps of the same issue.

Not that the quest of birds' eggs is in any way to be discouraged—far from it. While the eggs themselves, from the intrinsic beauty of their shape and coloration, form a never-ending source of delight to the collector, it is only through the energy of the hunter after these spoils that a knowledge of the habits of the birds themselves can ever be attained. In the words of Prof. A. Newton, it is the field naturalist who alone crowns the labours of the anatomist and the museum worker. "What engineer," writes the Professor, "can be said to understand his business if he knows not the purpose to which the machines he makes are to be applied, and is unacquainted with their mode of working. We may investigate thoroughly the organs of any animal, we may trace them from the earliest moment in which they become defined, and watch them as they develop to maturity, we may comprehend the way in which every part of a complicated structure is built up; but if we take not the trouble to know their effects on the economy of the creature, we as naturalists have done but half our task, and abandon our labour when the fulness of reward is coming upon us." All honour then to those (if only they work in the right way) who risk their health, if not their lives, and spend their treasure, in the quest of the rarer birds' eggs!

Although they have been removed from the list of desiderata, the eggs of the curlew-sandpiper will probably long remain among the rarest of those of the British species, those from the Yenisei being the only specimens at present known. Among the species included in the British lists whose eggs were unknown at least as late as 1896, is Pallas's grey shrike (*Lanius sibiricus*), but as this bird is so closely allied to the ordinary species, their discovery cannot be looked forward to with any special interest. The second is the needle-tailed swift (*Chætura caudacuta*), which has only twice been seen in Britain, and breeds in northern Asia, although its eggs are still unknown. Equally slight are the claims of the sharp-tailed sandpiper (*Tringa acuminuta*) to be regarded as British; and, although still unknown, its eggs will probably prove very similar to those of the American *T. maculata.* To the rare and beautiful wedge-tailed gull (*Rhodostethia rosea*), reported to have been once seen in Britain, is provisionally assigned a single egg in the British Museum obtained from Disco Bay. Of far more interest would be the discovery of the eggs of the Cape petrel (*Daption capensis*), since this bird, of which an example was killed in Dublin in 1881, represents a genus by itself. One of its breeding-places appears to be Kerguelen Island. Of two other petrels, namely *Œstrelata hæsitata* and *Œ. brevipes*, with equally slight claims to admission in the British lists, the eggs are likewise unknown.

Of species whose eggs are known, although of extreme rarity, next to the curlew-sandpiper, the white-billed diver (*Colymbus adamsi*), a by no means very rare visitor to our coasts, may first claim attention. The only known eggs, which are very like those of the great northern diver, were obtained during the voyage of the *Vega* in 1879. Of the lovely ivory gull (*Pagophila eburnea*) the eggs have been described by Prof. Collett; while those of the Iceland gull (*Larus leucopterus*) and Mediterranean black-backed gull (*L. melanocephalus*) come also under the category of rarities, the nest of the latter species being unknown. Of greater interest are the beautiful eggs of the Sandwich tern, of which additional specimens were recorded last year. Although obtained by Wolley, the eggs of the spotted redshank (*Totanus fuscus*) must be regarded as prizes by the collector; while so late as 1893 those of the solitary sandpiper (*T. solitarius*) were recorded by Mr. Dixon as unknown, although one clutch has been described by Mr. Elliot, in which the eggs resembled those of the piping sand-plover. Claim to a place in this section is undoubtedly held by the sanderling, of which eggs were obtained by MacFarlane in Arctic America in 1863, and subsequently by Colonel Feilden in Grinnell-land. The knot (*Tringa canutus*) is another of the species which appears in Mr. Dixon's book of 1893 as among those of which the eggs are unknown. It seems, however, that a clutch of four was taken in Greenland as far back as 1875, one of which is now in the British Museum; and these, with a single specimen taken from the body of a female by Lieut. Greeley, appear to be the only examples in collections. Far less uncommon are the eggs of the little stint (*T. minuta*), although they still come under the category of rarities, as do those of the jack snipe, which were first taken by Wolley in Lapland. The crestless lapwing (*Vanellus gregarius*), of which but one British specimen is on record, is also a bird of whose nidification details are wanting, although the eggs are known to be four in number, and very similar to those of the crested species. Dotterel eggs, although very handsome, can now scarcely be considered as rarities; but those of the lesser golden plover (*Charadrius dominicus*) are very scarce, although their similarity to those of the ordinary species renders them less interesting than would otherwise be the case.

Passing other members of the foregoing groups whose eggs are more or less scarce, allusion must specially be made to the common bernicle goose, of which it is a remarkable fact that eggs laid in a wild state are quite unknown, although this is somewhat discounted by the circumstance that birds have nested in captivity. Of the nearly allied red-breasted bernicle (*Bernicla ruficollis*) the eggs have, however, been discovered, and, except for their somewhat smaller dimensions, are stated to be indistinguishable from those of the bean-goose.

Although the eggs of all the species of birds of prey recorded as British are known, some are comparatively rare in collections. Among such may be mentioned those of the red-footed kestrel (*Falco vespertinus*), which although not uncommonly taken in Russia, were so poorly represented in the British Museum in 1896 that Dr. Bowdler Sharpe stated he was unable to properly define their characters.

In addition to those of Pallas's shrike, which have already been mentioned in the unknown list, the following are some of the rarer eggs among the British Passerines. From their beautiful markings the eggs of all the buntings are always favourites with collectors; and from their rarity those of the rustic bunting must be specially prized. Two only are in the Seebohm collection in the British Museum, although others have been described by Mr. Dresser, and yet others are mentioned by Prof. Newton as among the specialities of last year's collecting. Richard's pipit (*Anthus richardi*) affords an example of a bird of which the eggs are known, but the nest has never been described. Among comparative rarities the eggs of the yellow-browed willow-warbler (*Phylloscopus superciliaris*) and the marsh-warbler (*Acrocephalus palustris*) deserve passing mention, especially as many referred to the latter species appear to be nothing more than pale examples of the reed-warbler. Perhaps the greatest prizes among the British representatives of the group are, however, the eggs of White's thrush (*Turdus varius*). A nest, with eggs, from Ningpo attributed to this species is included in the Seebohm collection, and undoubted specimens are mentioned in Prof. Newton's list of new acquisitions. Less rare are the eggs of the black-throated ouzel (*T. atrigularis*), of which several clutches have been taken in the Altai, although the nest is still unknown. Another desideratum is the nest of the Siberian ground-thrush (*T. sibiricus*), of the eggs of which three specimens taken in Japan, and now in the Seebohm collection, were the only examples known up to 1896. Of the Arctic bluethroat (*Cyanecula suecica*) the eggs, which resemble those of a redwing in miniature, are far less rare, but must still be reckoned as among the collector's choicest treasures.

To go further into the British list would be beyond the limits of this article, while, as already said, species not occurring in that list must be excluded. An exception may, however, be made in favour of the rare Pander's chough-thrush (*Podoces panderi*), of the deserts of Central

Asia. Of this bird the eggs were first obtained, we believe, by Fedtchenko, and have ever since ranked as great rarities, and collectors will therefore be interested in finding specimens included among those collected last year and mentioned by Prof. Newton. R. L.

NOTES.

The Council of the Royal Society have invited Dr. Wilhelm Pfeffer, professor of botany in the University of Leipzig, and foreign member of the Royal Society, to deliver the Croonian Lecture on March 17. The subject of the lecture is to be "On the Nature and Significance of Functional Metabolism (*Betriebsstoffwechsels*) in the Plant." The lecture will be delivered in German. Prof. Pfeffer is well known among botanists for his two volumes on "Pflanzenphysiologie," published in 1881 from Tübingen, and the second edition of which was issued last year; while his views on the function of chlorophyll, and its absorption-spectrum, are familiar to workers on the physiology of plant-life.

More than 100 foreign zoologists have now consented to be members of the "Committee of Patronage" of the Fourth International Congress of Zoology, and a large number of them have expressed the hope that they will be able to be present at the meeting in August next. Among these we may mention the names of Prof. Häckel, of Jena; Prof. Graff, of Graz; Prof. Grassi, of Rome; M. Blanchard, of Paris; Baron Jules de Guerne, who has been associated with the Prince of Monaco; Dr. Jentink, of Leyden, who was President of the Third Congress; Dr. Dollo, of Brussels; and Prof. Collett, of Christiania. From the United States it is hoped there will be a somewhat large contingent; Profs. Osborn and Scott, Prof. E. B. Wilson, and Mr. Watasé, of Chicago, all hope to be able to come.

The sixth "James Forrest" Lecture of the Institution of Civil Engineers will be delivered on Thursday, March 17, at eight o'clock. Prof. W. Boyd Dawkins, F.R.S., the lecturer, takes for his subject "Geology in relation to Engineering."

The Mayor of Bradford presided at a meeting, held on Monday, for the purpose of considering a proposal to invite the British Association to Bradford for the year 1900. It was unanimously decided to send an invitation to the Association for the year 1900, and an executive committee was appointed to make arrangements if the invitation should be accepted.

It is expected that some of the observers of the recent total eclipse of the sun will give a preliminary account of their observations at the meeting of the Royal Astronomical Society to-morrow.

The Municipal Council of Paris have inserted in the budget for this year the sum of ten thousand francs, for the laboratory of photography and radiography at the Salpêtrière.

The following grants have recently been made by the Trustees of the Elizabeth Thompson Science Fund:—250 dollars to Prof. Gustav Hüfner (Tübingen), for the investigation of hæmin and hæmatine; 288 dollars to Prof. Carlo Bonacini (Modena), for researches in colour photography; 250 dollars to Prof. John Milne, to aid in a seismic survey of the world.

The Zürich correspondent of the *Times* states that the observatory on Mont Blanc, which was constructed by M. Joseph Vallot some seven years ago, is to be transferred to another site. The present structure is built on a small rocky plateau, which extends for a short distance from the Rochers des Bosses, but its position is no longer favourable for scientific observations. The construction of the building has served as a barrier against which the snow piles itself in ever-increasing masses, causing both trouble and expense to the observatory staff. The whole erection is to be transferred, piece by piece, on the backs of workmen from the Rochers des Bosses to a rocky point at the same altitude, where the ground will first be levelled by blasting, and, in spite of the difficulties of climate and transport attending these operations, it is hoped that the whole transfer will be finished in the course of one summer season.

At the meeting of the Entomological Society of London on March 2, a discussion took place on the reported introduction of the San José scale, *Aspidiotus perniciosus*, into Great Britain. Mr. R. Newstead, the only British entomologist who is now specially occupied with Coccidæ, stated that during the past nine years he had never once met with this species among the numerous scale-insects taken in this country and forwarded to him for identification. It was impossible even for an expert to distinguish it, without careful microscopical preparation and examination, from among the thirty or more described species of *Aspidiotus*, and any attempt to identify it on imported fruit by naked-eye observation, or with a hand-lens, was therefore quite impracticable. The risk of its distribution by importation on fruit was small; there was, however, much more likelihood of its introduction on plants or trees. At the same time he saw no reason to suppose that it would be more injurious in this country than the common *Mytilaspis pomorum*; in America the San José scale had several, sometimes as many as five, generations in the year, but in this climate it would probably conform with the habits of all other scale-insects at present investigated and become single-brooded. Mr. Newstead's conclusions were generally agreed with by the Fellows present.

According to the *Bulletin de la Société Française de Physique*, M. Crémieu has devised an ingenious means of producing elliptic sound-vibrations in air. By the interference of the longitudinal vibrations of two organ-pipes, placed at right angles, and vibrating under the influence of two diapasons with the proper difference of phase, an elliptic motion was set up at the intersection of the tubes, and its existence was made evident by means of delicate quartz fibres which followed all the movements of the air.

M. A. Leduc, in a paper read before the Société Française de Physique, criticises the well-known law of mixture of gases, according to which the pressure of a mixture is the sum of the pressures of its constituents at the same volume and temperature. This law is only true for perfect gases, and is then equivalent to the statement that the volume of the mixture equals the sum of the volumes of its constituents at the same pressure and temperature. From experiments on several gas-mixtures, M. Leduc considers that the second form of the law is rigorously applicable to certain mixtures of real gases, and is, in general, in closer approximation with experiment than the first.

In the *Annales du Bureau Central Meteorologique*, M. Moureaux gives an account of the different comparisons he has made between the magnetic instruments of the Parc Saint Maur Observatory and those of the observatories at Kew, Uccle (Brussels) and Pavlovsk (St. Petersbourg). The comparison observations made at Kew have already been described by Mr. Chree in a communication to the Royal Society. The declination at Pavlovsk was found to be 1′·3 higher than the French standard, the horizontal force 0·00013 lower, and the dip 0′·8 lower. At Uccle the declination was 1′·5 lower, the horizontal force 0·00002 lower, and the dip was not compared. In the account of the Kew comparisons an arithmetical error occurs which makes the horizontal force difference 0·00011 when it ought to be 0·00012.